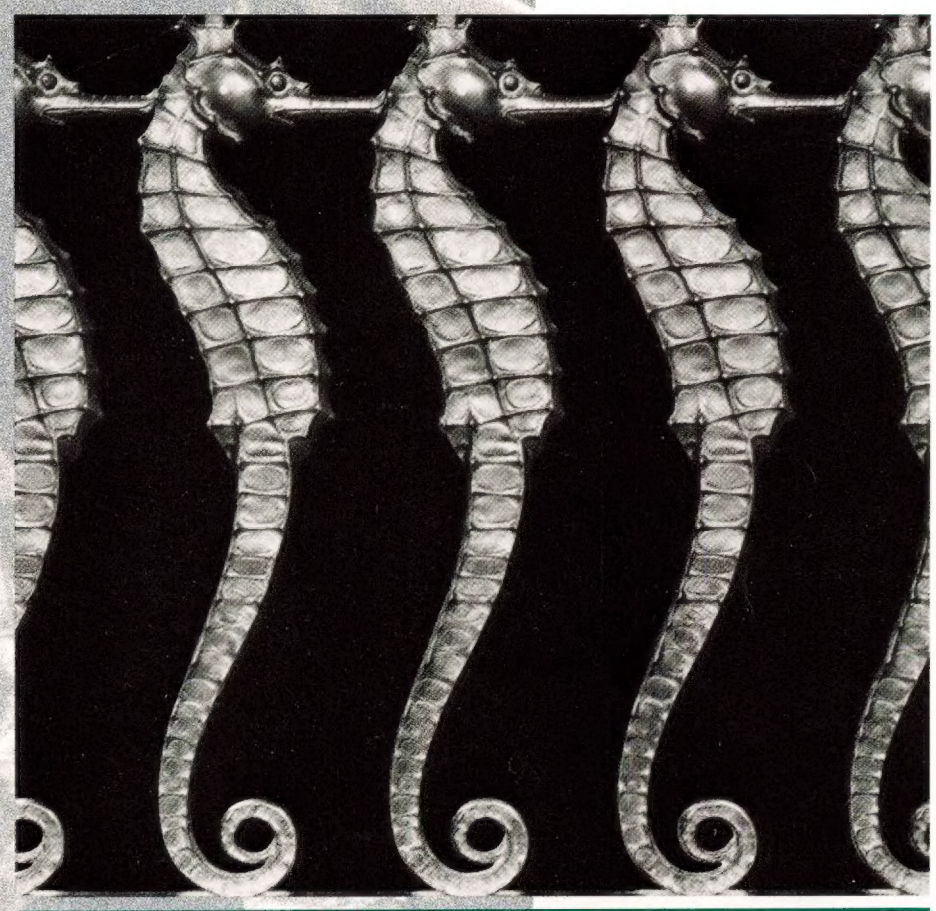
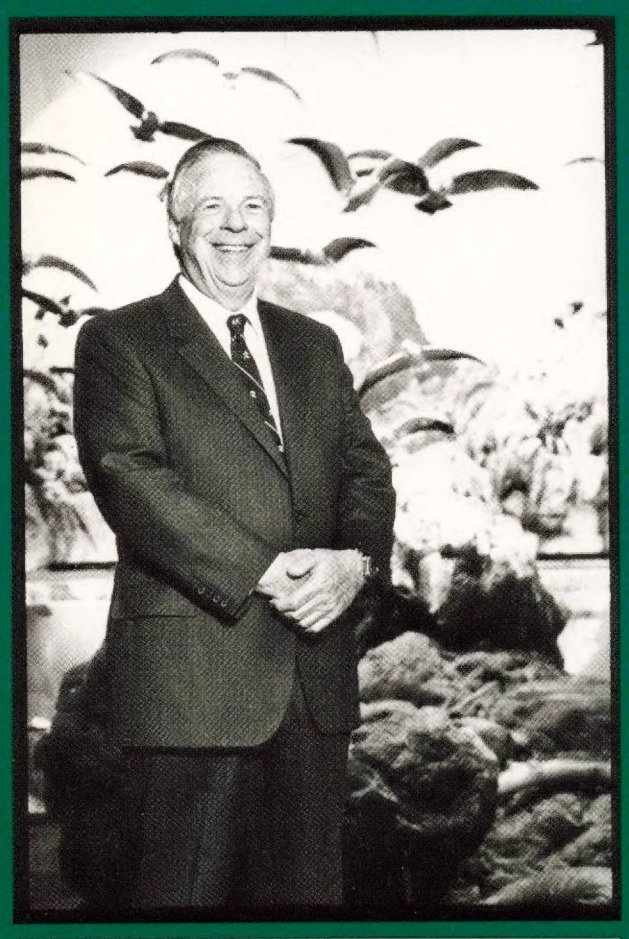
California Academy of Sciences

1988-1989



Annual Report

From the Chairman of the Board of Trustees

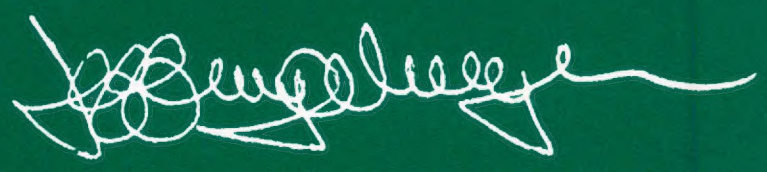


Natural history museums are changing dramatically. Our understanding of science, and the way that we organize and present it to the public are all undergoing rapid change. Today's visitors look to the natural history museum for information about global events as well as for guidance about environmental issues that affect them at home.

I am proud of the role that the California Academy of Sciences plays in this changing world of natural history. The excitement and energy that I have seen during my years as Chairman of the Board of Trustees have positioned the Academy well for the responsibilities and opportunities ahead.

The talent of our staff, and the leadership of our trustees have led to the creation of *Wild California,* which opened in 1988, and to *Life Through Time: The Evidence For Evolution,* the new hall that will open in 1990. They are remarkable and exciting new ways of informing our visitors. These halls, as well as our many temporary exhibits, our educational and outreach programs, and the research activities of our scientific staff, are evidence of the energy and momentum of this great institution.

As I step down from the Chairman's role, I take great pleasure in both the strength and the potential of the Academy. I wish my successor, Jerry Hume, and our new Executive Director, Roy Eisenhardt, great success. I also wish to thank the staff, my fellow trustees, and the many supporters who have made my work so rewarding.



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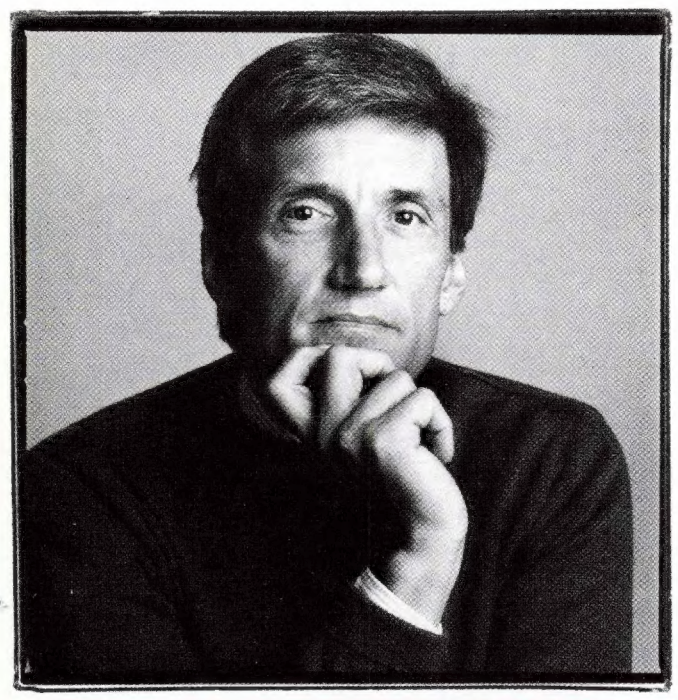
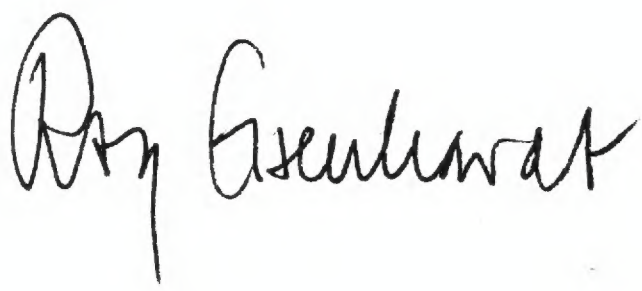


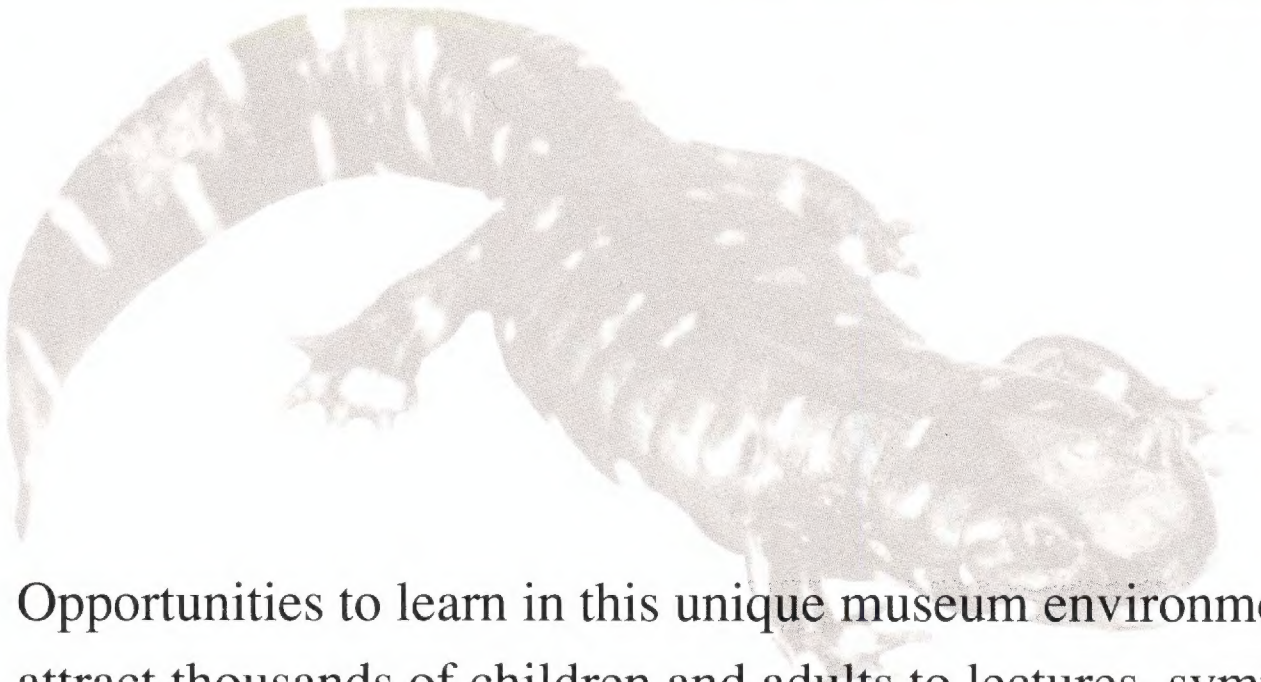
I have the honor of presenting to you the Annual Report for 1988-1989. Its purpose is to describe the multiple ways in which the Academy serves our community. We detail our educational programs, the work of our research scientists, and our public exhibits. I hope that you find this book interesting and educational.

I arrived at the Academy in May; thus, the accomplishments described in this report are credited to the stewardship of my predecessors. After six years of service to the Academy, Dr. Frank Talbot left during the year to take up new duties as Executive Director of the National Museum of Natural History at the Smithsonian Institution. Dr. John McCosker served admirably as Acting Director prior to my arrival. I thank them both for their leadership, and am honored to succeed them.

In my short time here, I have been struck by the breadth and scope of the activities of the staff, and by the generosity of scores of volunteers who assist in virtually every department of the Academy. I am grateful to the Board of Trustees and to the Fellows of the Academy for their wisdom and guidance. Our many members and supporters assure our continuation and growth. Ours is an exciting and lively environment because of the efforts of all of these people.

I am proud to join them.





Opportunities to learn in this unique museum environment attract thousands of children and adults to lectures, symposia, films, nature studies, tours, classes, and special events.

Education

The dynamic combination of active research and superb exhibits creates the perfect medium for innovative educational programs. Here at the natural history museum, curiosity is cultivated. Excitement, sparked by interaction between Academy educators and scientists, is transmitted to students of all ages. Concepts become tangible — and meaningful — with expert instruction, real objects, living organisms, and field expeditions.

Responding to community needs, Academy educators initiate effective training programs, workshops, and materials for school teachers that have an impact far beyond the museum's walls. This year, more than 150 elementary and middle school teachers attended sessions on the use of fossils to teach evolution, and using the Aquarium to teach concepts of adaptation and camouflage. More than 250 teachers participated in special *Wild California* teacher training workshops, designed to maximize the educational impact of the important new exhibit hall. Drawing upon staff expertise and resources, instructors provided current information on native California habitats and species. Teachers returned to their schools inspired, laden with study guides, ideas for classroom activities, and plaster casts of a grizzly bear's pawprint.

The Academy Library offers another dimension of service to the educational community. This natural history collection of 170,000 volumes and 2,100 current journals, critical support for Academy research efforts, is also made available to all teachers, as are state-of-the-art facilities including computerized bibliographic data bases compiled on compact disc, and many other special services. Library staff provide orientation programs introducing Bay Area teachers to this unique resource, and have recently focused outreach efforts at high school and community college science instructors and librarians.

Biology Forum, a series of three day-long Saturday sessions to inform high school science teachers of the latest findings in science, has drawn over 800 teachers since it was introduced four years ago. This year's Biology Forum focused on biogeography and brought 150 teachers together with 18 Academy Fellows whose expertise in their chosen disciplines assured the program's success. As a special adjunct to Biology Forum, 16 teachers from rural areas were selected by their districts to spend three consecutive, science-filled days at the Academy.

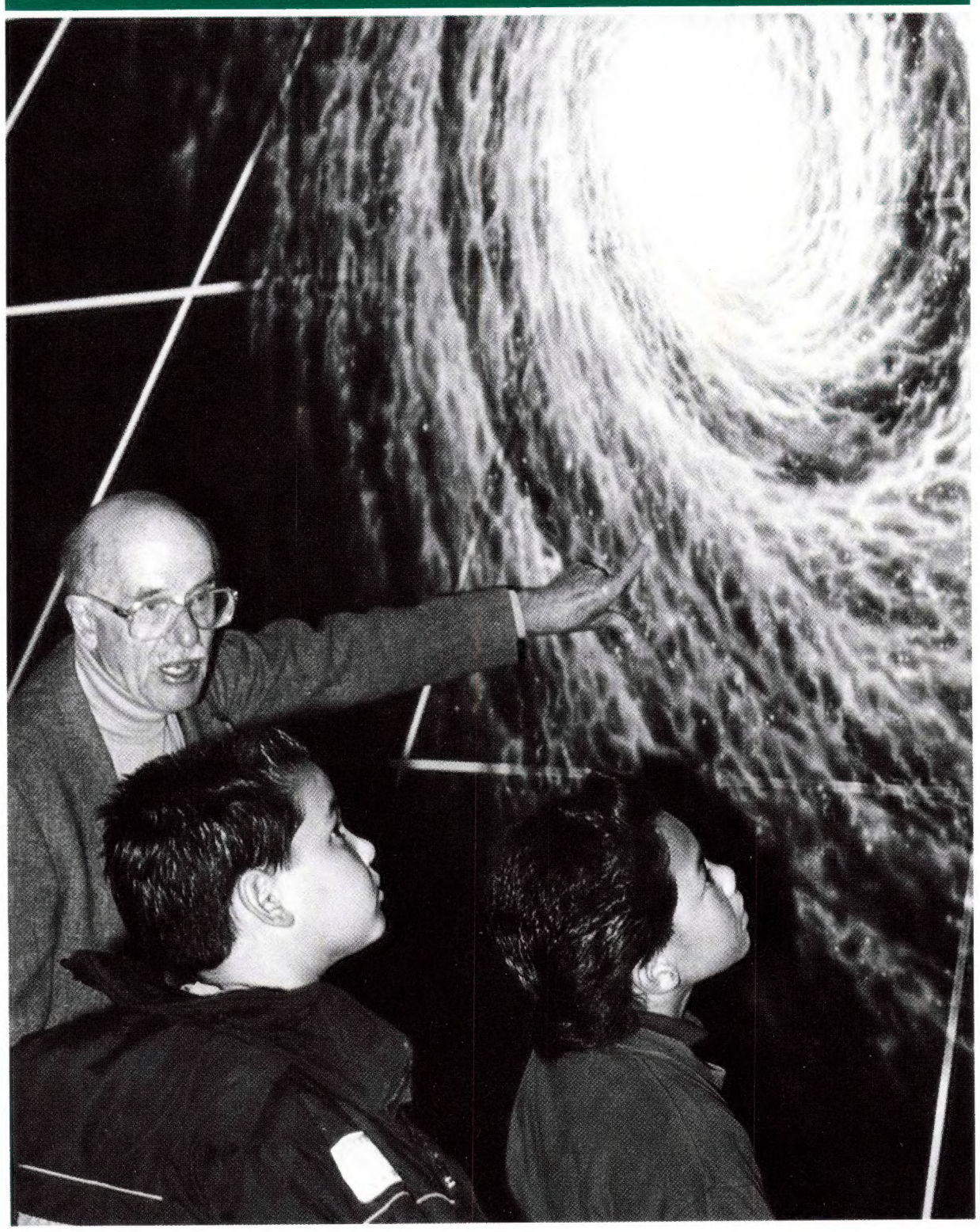
In addition, the popular Academy Store works closely with the Education Department to ensure that high quality books and materials are available to teachers, at a discount, for classroom projects and special exhibit-related studies.

The Docent Council is comprised of 225 volunteers, museum-trained science educators who are dedicated to helping young people learn more about the natural world and universe around them. Their diverse activities enrich science curricula on many levels, in both public and private schools. Through the Supervan outreach program, docents offer lively classroom presentations in natural science at schools throughout the Bay Area. Docent workshops encourage school teachers to take advantage of the museum to teach life sciences.

Spacious living laboratory and superb outdoor classroom, Pepperwood Ranch Natural Preserve in Sonoma County is the site of diverse educational programs. The Education Department and a growing constellation of universities, colleges, federal agencies, and environmental groups conduct classes, field experiments, and other nature studies here. Forty-four classes were held at Pepperwood this year, including 8 astronomy classes at the Academy's Hume Observatory.

Curious about global trends in fashionable headgear? Exploring the lifeways of many cultures is just part of the learning process in the Discovery Room. Hands-on (or heads-in) experiences with real artifacts stimulate thoughtfulness and greater understanding of the world we live in.

Elbow-deep in the study of starfish, Daly City schoolchildren admire these colorful denizens of Steinhart Aquarium—without leaving their classroom. The docent council's Supervan (and Super Mini-van) brought enrichment programs in natural science to almost 8,000 students at 123 Bay Area schools this year.



You are here! Two young men ponder their own unique place in the Milky Way Galaxy expertly guided through our local universe by Joseph Marshall, a veteran Academy docent of nine years. Docents led over 400 scheduled tours of the Academy's exhibit halls this year.

An exhibit is a powerful tool for instruction, combining objects and ideas to invite thought and discussion. The excitement of discovery that permeates the Academy's exhibit halls actually begins "backstage" with direct collaboration between scientists and exhibits staff.

Exhibits

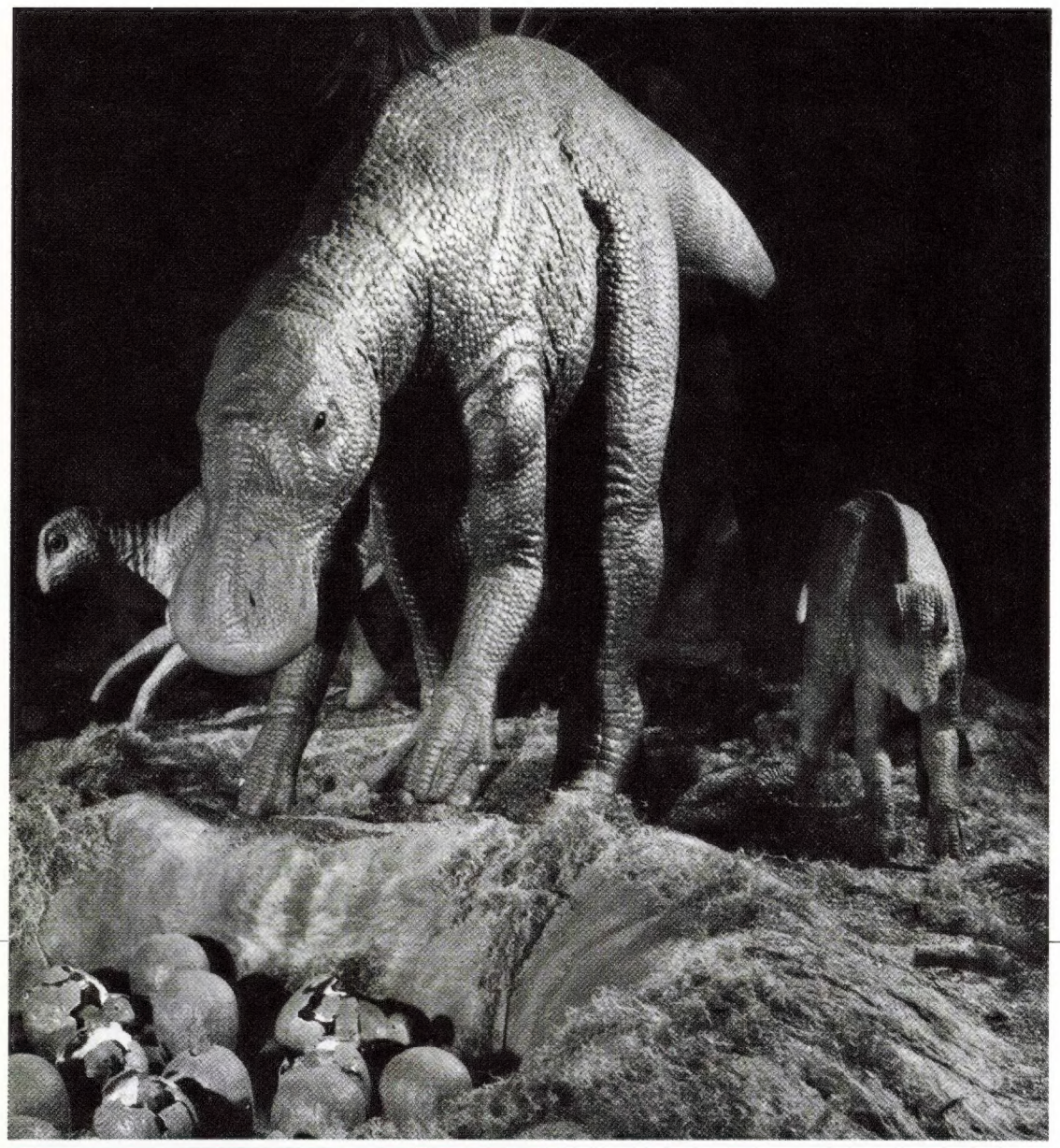
Display concepts are always informed by the collections-based research of scientific staff, then undergo interpretation and transformation in the skilled hands of exhibit professionals. These are designers, writers, artists and technicians who specialize in communication. Constantly researching and developing innovative educational methods and display techniques, they create and experiment with idea presentation — ways to make learning more fun. Committed to scientific accuracy and aesthetic excellence, these creative men and women share another common goal: to engage museum visitors and inspire them to become actively involved in the joy of exploring natural history.

The spirit of collaboration between scientists and exhibit professionals soared in Meyer Hall and gave form to *Wild California*, a triumph of innovative display. From a community of organisms competing for nutrients in a clump of rotting seaweed, to a parched desert floor, each exhibit astounds the perceptive viewer with the variety of ingenious adaptations to a particular habitat. An exhilarating summer *DinoFest '89* combined animated dinosaur models with fossils from Academy collections, bold murals, and lots of paleo-activities to expose visitors to the most current scientific views about dinosaurs.

Species loss is a serious concern at the Academy, where research proves that our planet's health relies on diversity in nature. Two traveling exhibits underscored the need to preserve as much biological diversity as possible: *Gorilla!*, produced by Academy staff for The Aperture Foundation of New York, illuminates the plight of both the mountain gorillas of Rwanda and their human neighbors. Closer to home, *Sliding Toward Extinction: Vanishing Wildlife of California* includes compelling portraits of threatened and endangered species by Academy photographer Susan Middleton. Organized by The Nature Conservancy, this stunning Academy co-production is now touring throughout the state.

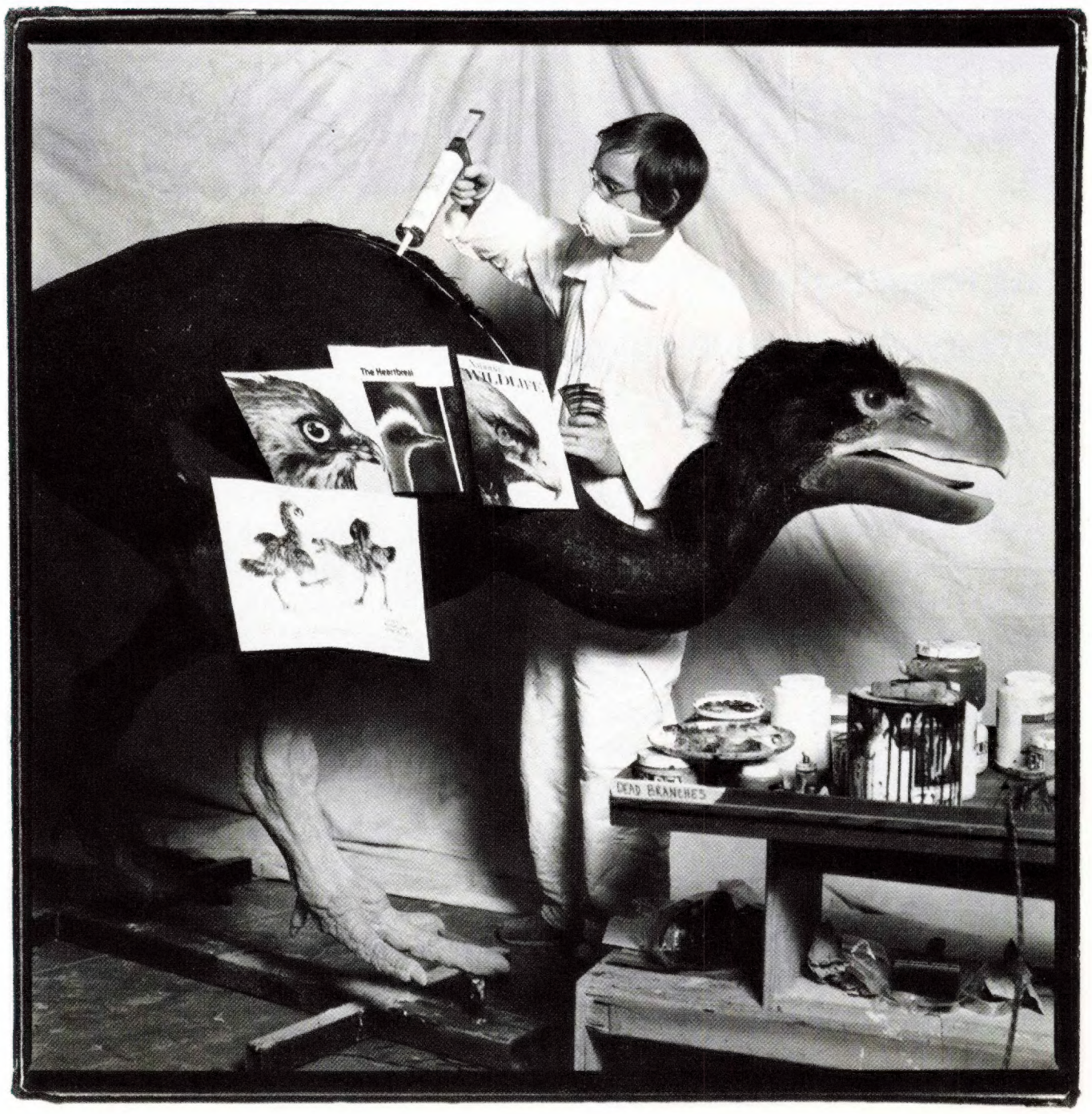
Rare ceremonial artifacts from Sepik River peoples of Papua New Guinea, assembled by the Tribal Arts Council of Switzerland as a fine art exhibition, received a dramatic new interpretation at the Academy. *River of Mystery* explored the lifeways and religious beliefs of Sepik villagers, revealing the richness and complexity of their cultural traditions. A survey of changes and challenges faced by contemporary peoples of New Guinea reinforced the value of cultural diversity in our highly interdependent world. A special "Academy" section described the research efforts of staff scientists who study the biologically diverse life communities of the world's second-largest island, using the Christensen Research Institute as field base and laboratory.

We're very excited about *Life Through Time,"* reports project designer Linda Kulik, pictured with a scale model of a Coal Forest diorama. "When it opens in 1990, this exhibit hall will break new ground, using fossil evidence to trace the genealogy of life on the changing face of our planet. It's a new way of looking at relationships, and the context in which to understand the evolution—in form, in space, and in time—of life on Earth."



A warrior in full regalia gazes out from a photomural in *River of Mystery,* an exhibition about peoples of the Sepik River region of Papua New Guinea. In the early 1900's, warfare was closely linked with religion; shields and weapons were considered sacred objects. Men wore ornaments into battle to enhance their ferocity and splendor.

Guarding hatchlings and older chicks, *Maiasaura* ("good mother dinosaur") is one of several celebrities featured at *DinoFest '89.* The recent discovery of a *Maiasaura* nesting colony in western Montana confirms long-standing views about dinosaur parenting: Based on the behavior of their closest living relatives, birds and crocodiles, scientists expected that dinosaurs were good parents. The Montana discovery provides the evidence!



Too young to leave the nest, three *Diatryma* chicks will join their 7-foot-tall mother in the soon-to-open exhibit hall, *Life Through Time.* The family group will star in a scene portraying life in the Bighorn Basin of Wyoming some 50 million years ago. Based on the evidence of a single fossil and ongoing research, these are the very first reconstructions of juvenile *Diatryma.*

Aquarium

Steinhart Aquarium is home to more than 14,000 fish, hundreds of invertebrates, dozens of aquatic birds, and an array of frisky marine mammals.

Caring for a resident host of animals and their diverse habitats demands a wealth of expertise. Aquatic biologists and engineers are frequently called upon to share their specialized knowledge with the community. They respond enthusiastically with advice, lectures, interviews, radio spots and television programs. Steinhart Aquarium is a valuable information resource for the media, government agencies, students, and hobbyists. Aquarium staff have recently been in the public spotlight to explain the dynamics of shark attack, to provide advice on public safety issues, and to solve the mystery of Marin County's humming toadfishes.

The popular *Tidepool Touch Tank* was renovated and enlarged this year, much to the delight of wet-sleeved young audiences. Staff completed a new 14,000 gallon *Farallon Islands Aquarium*, bringing life — and a riot of color — into the Academy's newest exhibit hall, *Wild California*. Meanwhile, back at the Swamp, visitors thronged to see a 1,500 pound Great White Shark that was captured and donated, fresh-frozen, by Half Moon Bay fisherman Mike McHenry. To house the magnificent specimen, Aquarium staff designed and constructed a glass freezer case to allow unobstructed and chilling views of the beast.

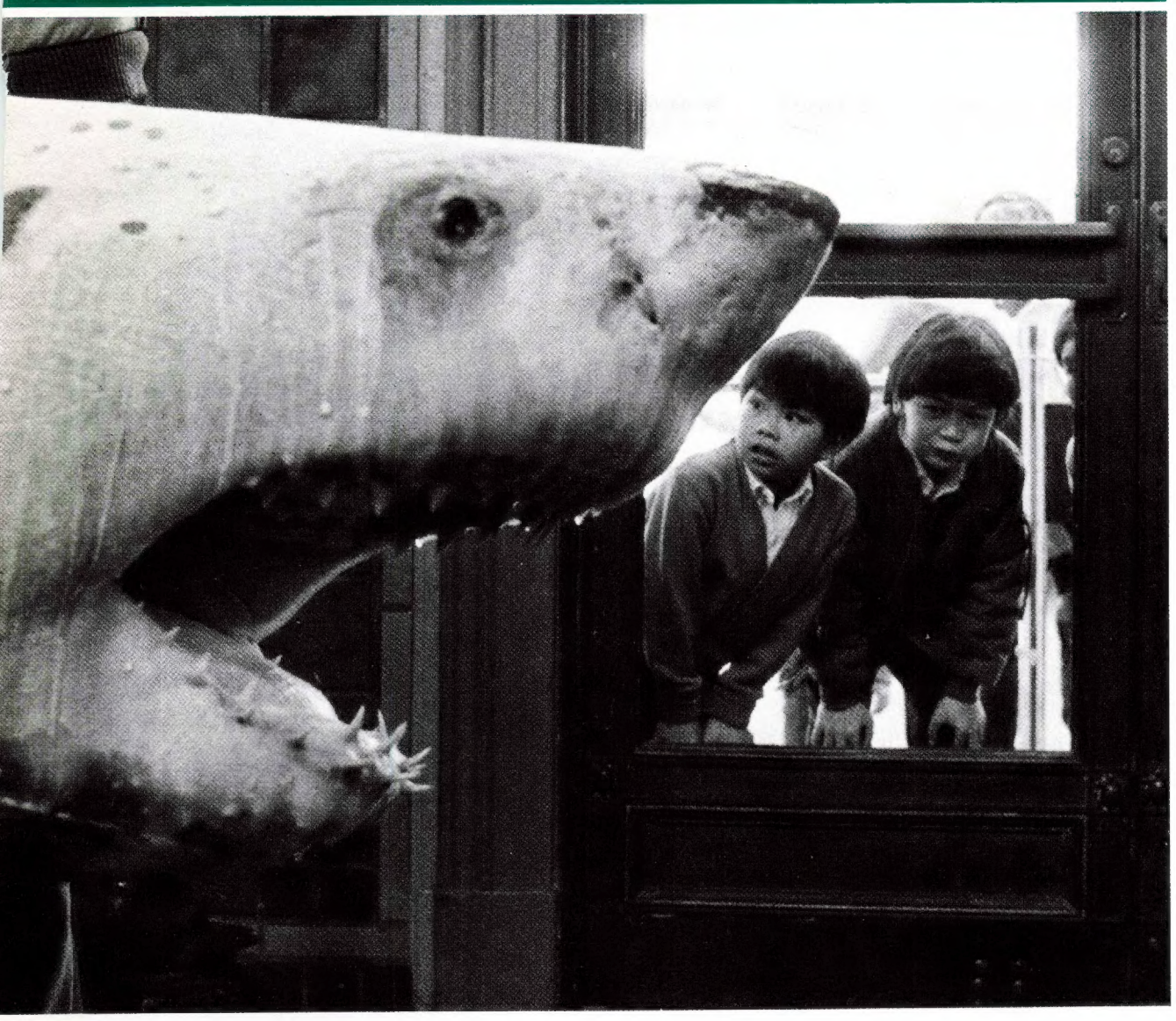
Planetarium

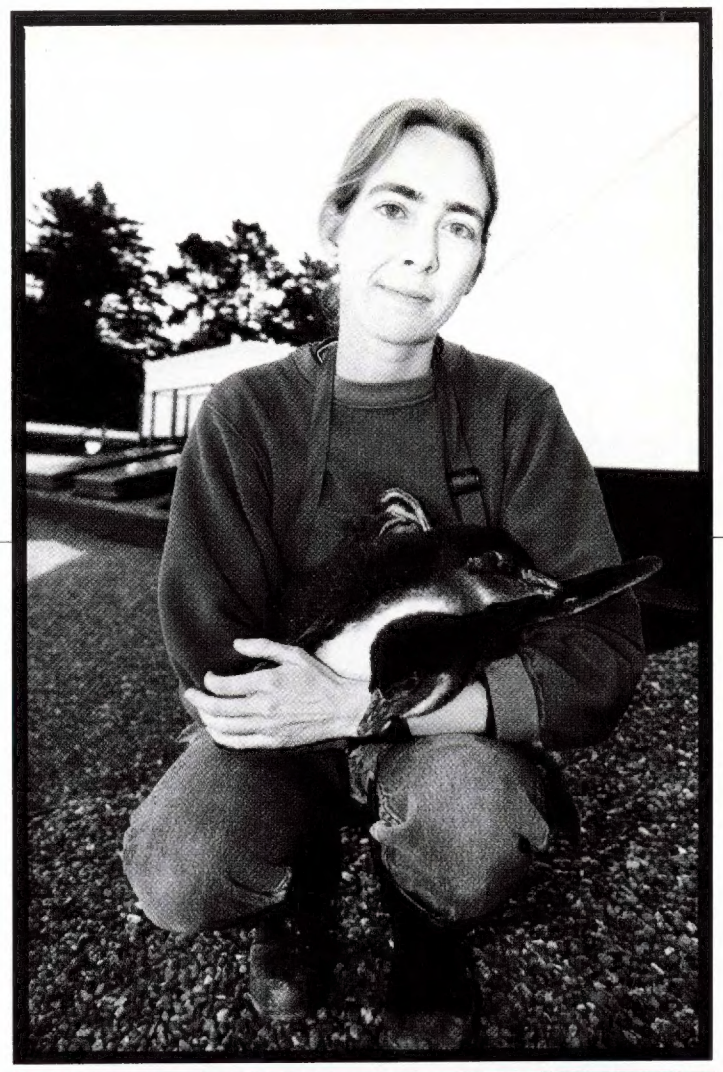
Long renowned as a "Star Theater" offering programs both educational and entertaining, Morrison Planetarium is also an important community information resource.

Knowledgeable staff respond to scores of public inquiries each week, ranging from the usual (questions about solstices, equinoxes, eclipses and meteor showers) to the incredible ("How do I report a UFO?"). Calendar publishers want the scoop on moon phases. Professionals in radio, television, and print media rely on the Planetarium for facts and clarification on celestial events.

Stellar achievements in promoting astronomy education can be credited to the initiative and innovation of dedicated Planetarium staff. This year, almost 40,000 northern California students attended school presentations especially designed for their grade level. Over a thousand teachers received packets of information and classroom activities developed to prepare young scholars for a trip to the Planetarium. Attendance at informative public shows topped 100,000. At a Lunar Sample Workshop sponsored by the Planetarium in conjunction with NASA/Ames Research Center, more than sixty local teachers were certified to borrow samples of moon rocks and soil gathered by Apollo astronauts at six lunar landing sites.

Talk about jaws...get a load of these! An enthralled audience of two gets an unforgettable sneak preview of the newest Aquarium exhibit. Even frozen, there's just something about a 1,500-pound great white shark that seems to command attention—and a healthy respect. The specimen will be an important addition to the Academy's ichthyological research collection.





Aviculturist Karen Anderson studies breeding behavior in the Black-footed Penguin colony at Steinhart Aquarium. Karen proudly reports a successful season, with 11 chicks fledged out of 14 eggs hatched—a survival ratio that exceeds that in nature.

The universe at his fingertips! After years of planning, and a herculean installation effort, the staff of Morrison Planetarium can now boast a fully automated planetarium control system. Bing Quock, chief writer and producer of star shows, is pictured here at the new control console. The SPICE system is the most dramatic improvement to the Planetarium since its opening in 1952.

Everywhere, interest in science is increasing. Concern for the health of the planet is growing, and with it, a new awareness of human impact upon the environment. There is heightened expectation that better scientific understanding will lead to wiser management of world resources, including our precious reservoir of wild species, known and unknown.

Research

As we approach a new millennium, there is a crucial need to understand our relationship to the natural world.

Academy scientists explore the diversity of nature. They study what exists and has existed on this planet, how the Earth and its inhabitants have evolved and continue to change over time. This is basic research — knowledge for its own sake — and the key to comprehending and living harmoniously within the world ecosystem. If ever there was urgency for such knowledge, it is in this time of rapid social and environmental change.

Studies take place both in the field on living material in its natural environment and in the museum, using a vast information base of millions of natural objects. Staff scientists gather, preserve, and investigate specimens in systematic collections of minerals, plants, animals, and artifacts of human cultures. Research collections form the basic and essential tool for comparative study; the Academy's are among the most valuable in the world.

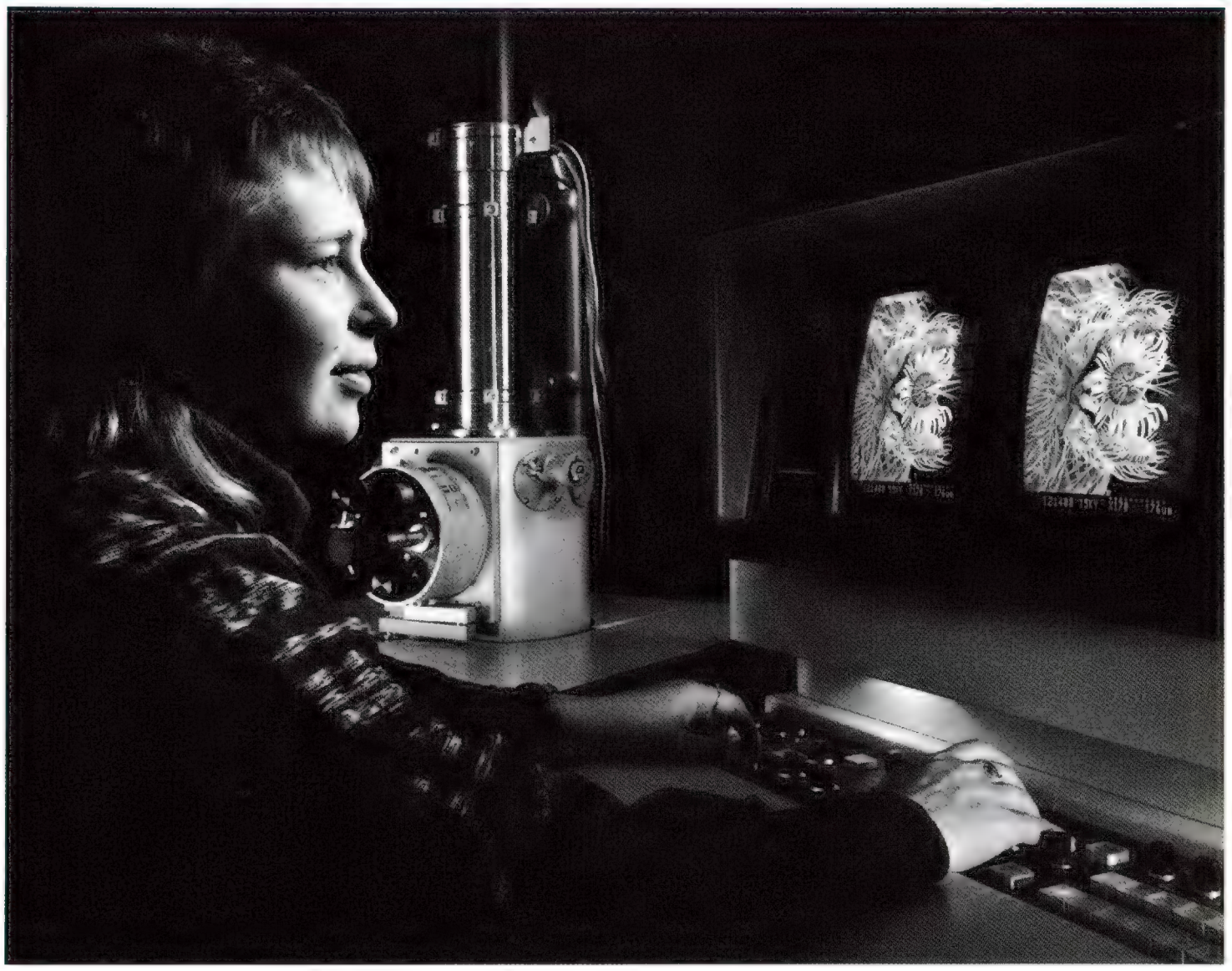
The activities of Academy scientists extend beyond the discovery, inventory, and description of global diversity. As students of evolution, they reconstruct the genealogies of organisms and groups of organisms, both living and fossil. They strive to understand the dynamic processes of plate tectonics and the effect of continental drift on past and present distribution of life on Earth.

Academy scientists are actively involved in the process of discovery. They communicate their findings by publishing in scholarly and popular journals, attendance at professional meetings, collaborating with exhibit professionals, in lectures and teaching. Their work is vital, as is their passion for exploration. Indeed, both are central to all of the Academy's educational efforts. Clearly, sharing the results of expeditions and collections-based research is of immense benefit to the community. But it is by transmitting the enthusiasm of its scientific staff, to infuse the public with their excitement for discovery, that the California Academy of Sciences makes its most important contribution to science education.

The Badlands of Montana yield rich treasure to dinosaur detectives! A team of Academy geologists and paleontologists discovered a well-preserved skull of mighty *Triceratops* during a fossil-hunting expedition. Carefully excavated, the specimen received a protective plaster jacket for the long journey to its new home in *Life Through Time.*

The Academy's Jacques Gauthier (posing here with a 6-foot-long water monitor) and Michael Ghiselin were among 50 scientists selected worldwide to present papers at the Nobel Symposium on Evolution held in Sweden in fall, 1988. Active members of the global scientific community, Academy scientists participate in many international symposia and congresses.

Mary Ann Tenorio studies the abdomen of a spider under an electron scanning microscope in the Entomology department. Academy research staff seek to discover and explain differences and similarities between organisms and natural systems, to find patterns within this diversity, and to investigate the processes that have produced these patterns.



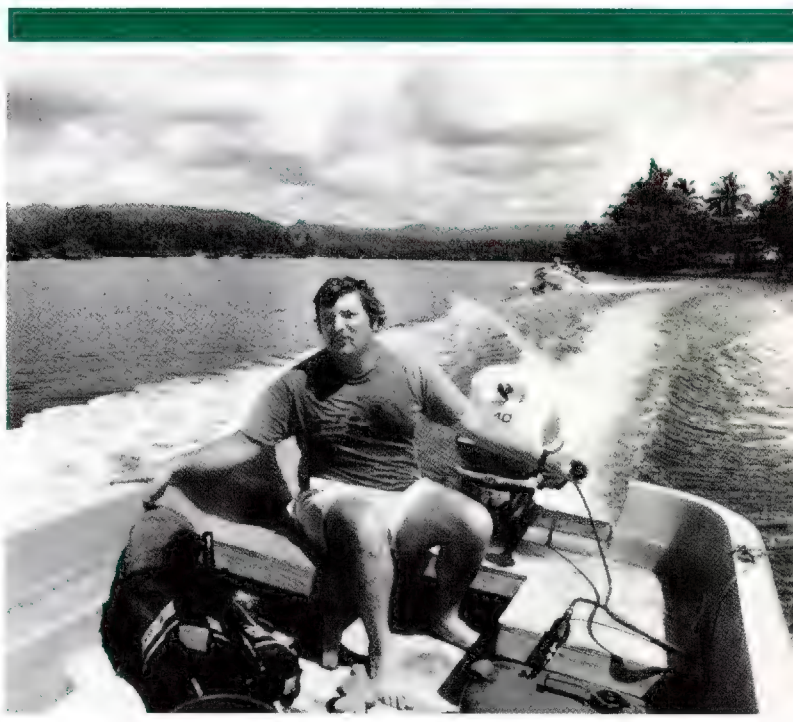
The Academy's research collections are used very much like libraries. Each year, over a thousand scientists visit the Academy to study its collections, and hundreds of thousands of specimens are lent to scholars and museums all over the world. Upon request, staff scientists identify specimens for, and provide expertise to, students, government agencies and the media.

Research

Working hand-in-hand with Academy staff, nearly 500 volunteers (in addition to docents!) serve in nearly every Academy department. Volunteers provide invaluable service in public museum areas, as well as behind the scenes. Bill Munich, shown working in the Academy's mineral collection, has volunteered in Invertebrate Zoology and Geology for more than ten years.

Growth and Use of Collections in Research Departments

DEPARTMENT	ACQUISITIONS Total specimens accessioned	LOANS Total specimens loaned	RESEARCH Total visitors (Number of visitor days)
Anthropology	261	192	68
Aquatic Biology	N/A	N/A	650
Botany	19,966	13,406	154
Entomology	140,739	78,023	1,052
Herpetology	3,287	729	169
Ichthyology	4,645	5,871	168
Invertebrate Zoology and Geology	65,000	6,010	81
Ornithology and Mammalogy	1,235	614	1,258
Totals	235,133	104,845	3,600
Total holdings in all collections			14,090,707
Percentage of growth since 1972 for all departments			64.9%
Average growth/year in number of specimens, for all departments			346,599



Rainforests and coral reefs are the world's most diverse habitats. As these habitats diminish, the urgency to study their biota increases at an alarming rate. Invertebrate zoologist Terry Gosliner conducts field research on nudibranchs in Papua New Guinea at the Christenesen Research Institute in Madang.

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Each year, one prominent Fellow is selected for special honors. At the annual Fellows' meeting in October 1989, the institution's highest honor, the Fellows' Medal, was presented to Dr. Bruce A. Bolt, Professor of Seismology and long-time Director of the Seismographic Station of the University of California, Berkeley. Dr. Bolt is recognized as an international authority on geophysics and seismology, and his accomplishments include a career as a teacher, distinguished scientist, and author of many important publications, including a leading textbook in seismology.

DISTINGUISHED SERVICE AWARDS

This year, Fellows' Distinguished Service Awards were awarded to Dr. John S. Hensill, and to W.I. Follett. Dr. Hensill, Professor Emeritus of Biological Sciences and Emeritus Dean at San Francisco State University, served as a Trustee of the Academy for 15 years, and has an ongoing interest in science education at the Academy.

John S. Hensill

W.I. Follett, who successfully carried out dual careers as an attorney and as Curator of Ichthyology at the Academy (1949-1969), now serves as Curator Emeritus. His studies of the taxonomy and nomenclature of the fishes of California, and his work in the identification of fishes in Indian middens (shell mounds) are important contributions to research at the Academy.

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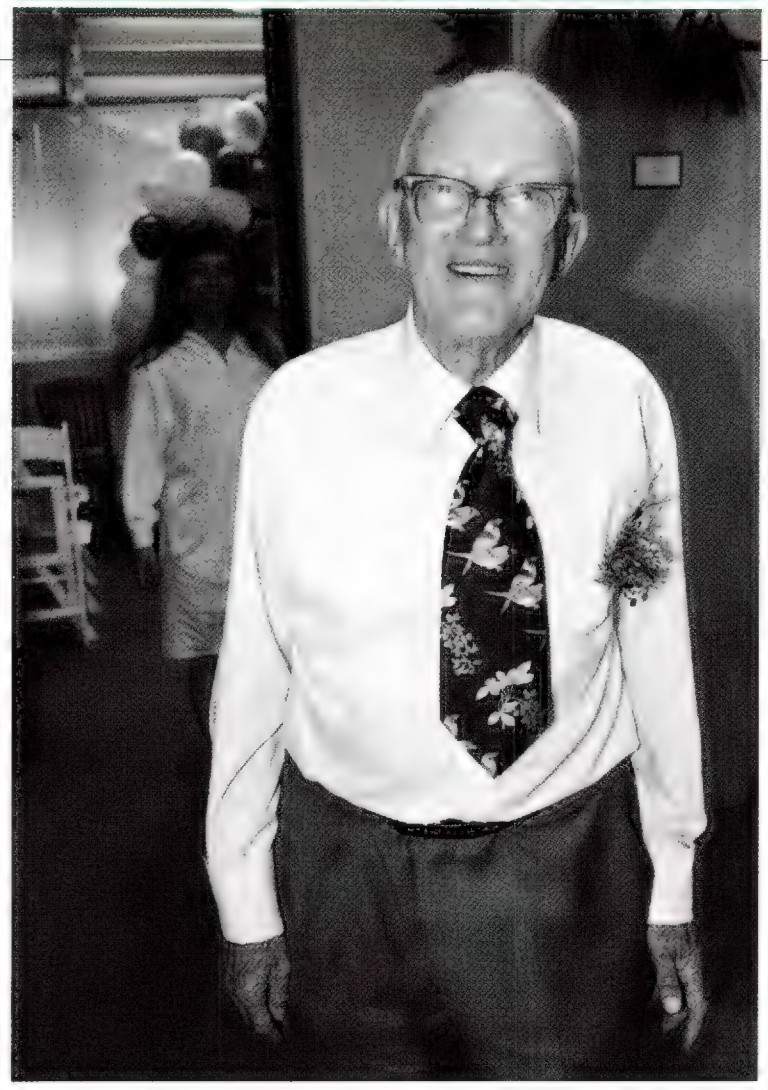

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The volunteers listed below contributed nearly 41,000 hours in service to the Academy during 1988-1989. Each department benefited from the skills, generosity and commitment of these 733 individuals. The Academy acknowledges with gratitude their very significant contribution.

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Li-Sc	**Library-Special Collection**
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Staff Publications

ANTHROPOLOGY

Scientific Publications

Carroll, D.L. 1988. Looms and textiles of the Copts. First millennium Egyptian textiles in the Carl Austin Rietz Collection of the California Academy of Sciences. *Memoirs of the California Academy of Sciences* No. 11:1-202.

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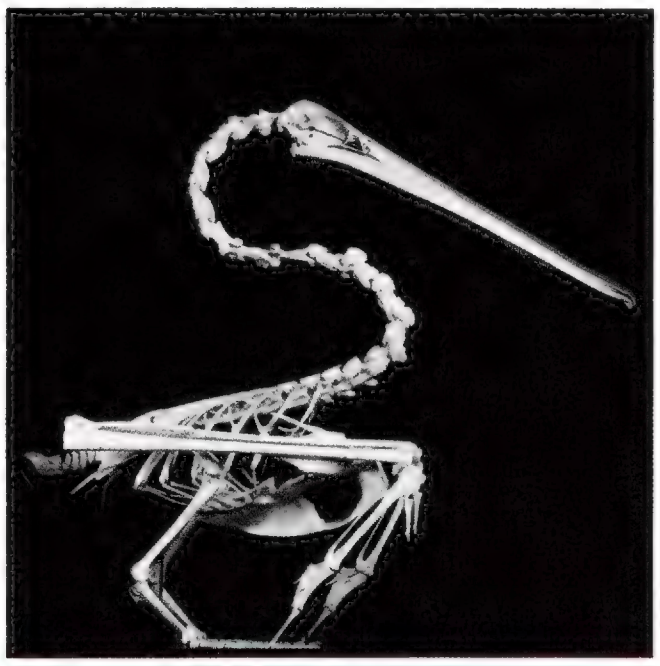

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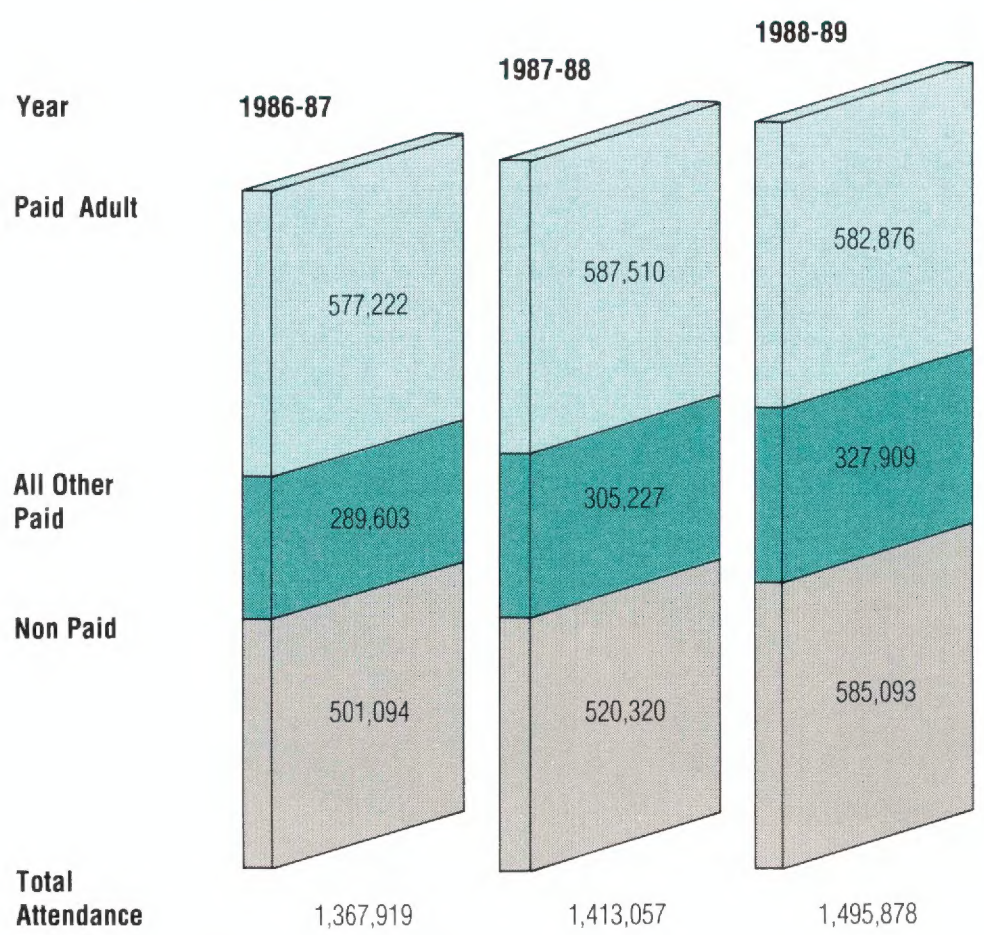
Financial Statements

Balance Sheet

June 30, 1989
(with comparative totals for 1988)

	Current Funds		Funds functioning as endowment		Museum Modernization	Total all funds	
	General Operating	Restricted	General Purpose	Restricted	Fund	1989	1988
ASSETS							
Cash and cash equivalents:							
Commercial accounts	$ 187,214	89,371	-	68,276	145,538	490,399	908,675
Savings accounts and money market funds	-	1,479,285	-	-	4,193,170	5,672,455	6,898,791
Receivables:							
Research grants	-	549,042	-	-	-	549,042	733,183
Accrued interest and dividends	-	-	112,141	79,142	-	191,283	236,109
Other	260,539	85,089	188,971	8,950	2,226	545,775	471,109
Inventory	267,111	-	-	-	-	267,111	252,306
Prepaid expenses	337,306	3,345	-	-	11,429	352,080	215,831
Investments in marketable securities	-	-	21,928,432	8,330,095	-	30,258,527	23,910,070
Real property	-	-	1,258,084	808,460	-	2,066,544	2,066,544
Due from (to) other funds	(219,759)	216,467	(21,752)	(87,978)	113,022	-	-
Total assets	$ 832,411	2,422,599	23,465,876	9,206,945	4,465,385	40,393,216	35,692,618
LIABILITIES AND FUND BALANCES							
Liabilities:							
Accounts payable and accrued expenses	$ 676,918	99,659	-	2,516	309,449	1,088,542	745,322
Note payable	45,000	-	-	-	-	45,000	90,000
Deferred grant revenue	-	542,691	-	-	-	542,691	668,511
Deferred income	72,525	-	-	-	-	72,525	87,737
Deferred restricted support	-	-	-	-	2,953,008	2,953,008	6,323,809
Other liabilities	37,968	7,150	-	-	2,586	47,704	52,153
Funds held in custody	-	-	-	-	-	-	12,668
Total liabilities	832,411	649,500	-	2,516	3,265,043	4,749,470	7,980,200
Fund balances:							
Current restricted:							
Research grants	-	20,496	-	-	-	20,496	68,473
Special projects	-	1,752,603	-	-	-	1,752,603	1,551,580
Museum modernization	-	-	-	-	1,200,342	1,200,342	698,056
Endowment funds, substantially under board discretion	-	-	23,465,876	9,204,429	-	32,670,305	25,394,309
Total fund balances	-	1,773,099	23,465,876	9,204,429	1,200,342	35,643,746	27,712,418
Total liabilities and fund balances	$ 832,411	2,422,599	23,465,876	9,206,945	4,465,385	40,393,216	35,692,618

Three Year Attendance at the California Academy of Sciences



The information on these pages has been summarized from audited financial statements, copies of which are available upon request from the office of the executive director.

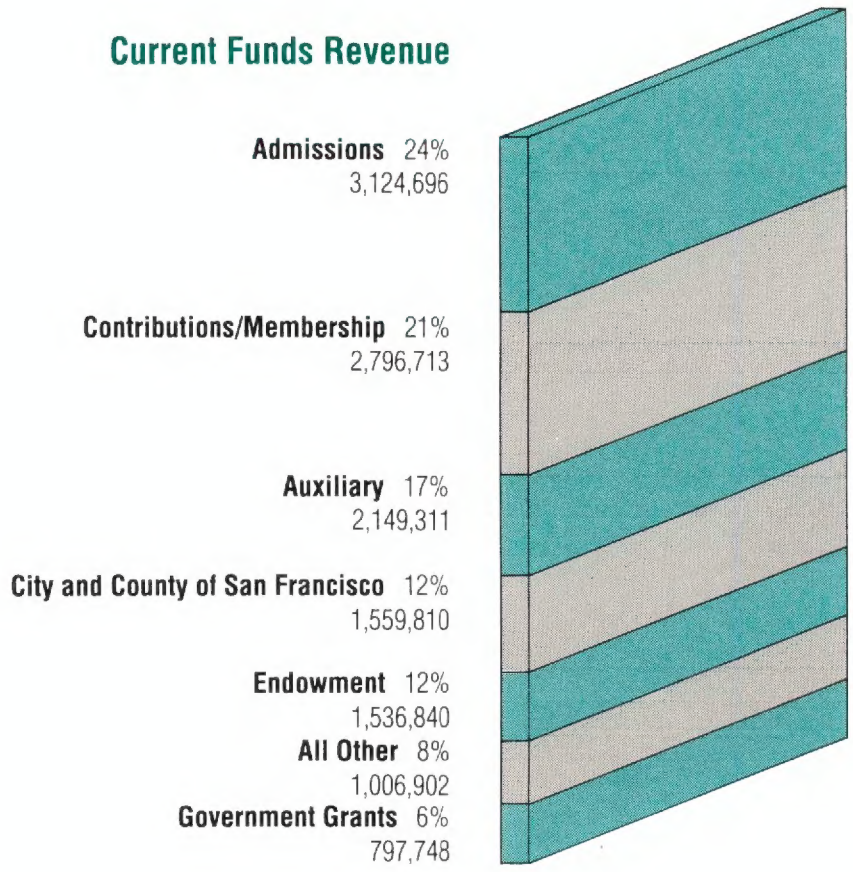
Financial Statements

Statement of Current Funds' Revenues, Expenses, Transfers, and Fund Balances

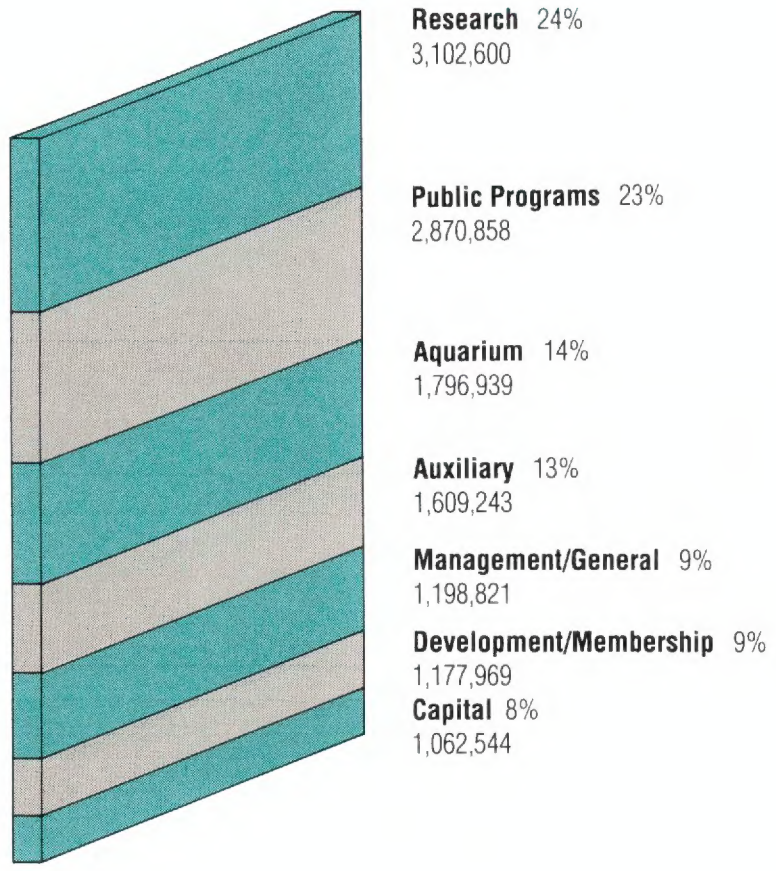
Years ended June 30, 1989 and 1988

	1989			1988		
	General Operating	*Restricted*	*Total*	*General Operating*	*Restricted*	*Total*
Operating revenue:						
Admissions	$ 3,124,696	-	3,124,696	2,649,449	-	2,649,449
Contributions	1,049,008	930,509	1,979,517	939,804	786,002	1,725,806
Memberships	559,746	7,450	567,196	583,632	-	583,632
Tuition and program fees	218,528	31,879	250,407	233,817	65,291	299,108
Auxiliary activities	1,992,521	156,790	2,149,311	1,636,709	80,081	1,716,790
Other miscellaneous revenue	70,614	160,968	231,582	101,789	252,270	354,059
Government grant income	75,000	722,748	797,748	-	790,747	790,747
City and County of San Francisco	1,559,810	-	1,559,810	1,594,403	-	1,594,403
Total operating revenue	8,649,923	2,010,344	10,660,267	7,739,603	1,974,391	9,713,994
Nonoperating revenue:						
Unrestricted endowment allocation	1,053,623	-	1,053,623	1,089,377	-	1,089,377
Special donations	250,000	-	250,000	265,000	-	265,000
Commercial building rent, net	483,217	-	483,217	534,786	-	534,786
Investment income	22,542	127,573	150,115	9,897	79,424	89,321
Restricted funds transfers	233,395	141,403	374,798	117,404	189,178	306,582
Total nonoperating revenue	2,042,777	268,976	2,311,753	2,016,464	268,602	2,285,066
Total revenues and transfers	$ 10,692,700	2,279,320	12,972,020	9,756,067	2,242,993	11,999,060
Expenses:						
Research	$ 2,509,893	592,707	3,102,600	2,317,552	754,438	3,071,990
Public programs	2,465,099	405,759	2,870,858	2,392,929	357,369	2,750,298
Aquarium	1,748,482	48,457	1,796,939	1,586,362	89,989	1,676,351
Development and membership	938,581	239,388	1,177,969	909,237	191,311	1,100,548
Auxiliary activities	1,456,854	152,389	1,609,243	1,100,652	65,062	1,165,714
Management and general	1,128,674	70,147	1,198,821	1,265,976	53,393	1,319,369
Gov't grant overhead cost reimbursement	(140,515)	140,515	-	(140,384)	140,384	-
Total operating expense	10,107,068	1,649,362	11,756,430	9,432,324	1,651,946	11,084,270
Capital expenditures	585,632	476,912	1,062,544	323,743	318,612	642,355
Total expenses	10,692,700	2,126,274	12,818,974	9,756,067	1,970,558	11,726,625
Excess of revenues and transfers over expenses	-	153,046	153,046	-	272,435	272,435
Fund balances, beginning of year	-	1,620,053	1,620,053	-	1,347,618	1,347,618
Fund balances, end of year	$ -	1,773,099	1,773,099	-	1,620,053	1,620,053

Current Funds Revenue



Current Funds Expenses



Each year, the Academy holds the Photography Contest for Young People. San Francisco student Chris Schapp won first place in the People at Work and Play category with this photo.

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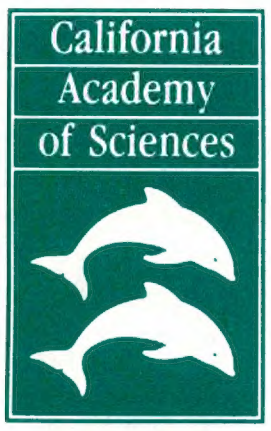

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